Accelerator Controls Section
Test Procedure: assy # 94028164 1300nM F/O transmitter, MMTX

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Equipment Used: 2 channel oscilloscope
                    2 oscilloscope probes
                    previously tested 3U f/o chassis with +/- 5V power supplies (available in rack 5, lab 1)
                    previously tested F/O receiver SMRX assy # 94028099
                    TX transition module with both TTL and ECL inputs (located in rack 5, lab 1)
                    RX transition module with both TTL and ECL outputs (located in rack 5, lab 1)
                    2 multimode (62.5/125) f/o jumpers
                    source of AGS/BOOSTER timeline (available in rack 5, lab 1)
                    FOTEC optical power meter (set wavelength to 1300nm, set power scale to dbm)
                    2 twinax cables
                    portable timeline decoder (blue box)
                    twinax to oscilloscope adapter
                    digital volt ohm meter (DVM)
                    f/o xmit schematic (drawing # 94028164)

1.0 General Inspection

1.1 Documentation
        a. Record serial number.
        b. Record revision number of module.

1.2 Physical Inspection
        a. Inspect front panel for defects.
        b. Inspect module assembly for workmanship to applicable IPC standards.

2.0 Electrical Tests

2.1 Power to ground shorts
        a. using the DVM confirm there are no electrical shorts between +5V and ground.
        b. using the DVM confirm there are no electrical shorts between -5.2V and ground.

2.2 Indicator tests TTL inputs
        a. On the module install jumpers E5-E6, E7-E8, E9-E10, E11-E12.
        b. Plug transmitter under test and previously tested receiver into the 3U chassis.
        c. Turn power on.
        d. Verify that both transmit active LED's are off.
        e. Plug the timeline source into the TTL DATA IN 1 twinax located on the xmit transition module.
        f. Verify that Chan 1 TX active LED is lit and that Chan 2 TX active LED is off.
        g. Plug the timeline source into the TTL DATA IN 2 twinax located on the xmit transition module.
        h. Verify that Chan 2 TX active LED is lit and that Chan 1TX active LED is off.

2.3 Optical output power with TTL circuitry
    a. Plug the timeline source into the TTL DATA IN 1 twinax located on the xmit transition module.
    b. Turn on the FOTEC power meter, set power to dbm scale and wavelength to 1300nM.
    c. Connect a fiber optic jumper between Chan 1 f/o output and the power meter.
    d. Verify the output power reads so where in the range of -19 to -14 dbm.
    e. Plug the timeline source into the TTL DATA IN 2 twinax located on the xmit transition module.
    f. Connect a fiber optic jumper between Chan 2 f/o output and the power meter.
    g. Verify the output power reads so where in the range of -19 to -14 dbm.

2.4 Link operation test with TTL circuitry
    a. Plug the timeline source into the TTL DATA IN 1 twinax located on the xmit transition module.
    b. Connect Chan 1 f/o xmit output with Chan 1 receiver f/o input using a f/o jumper.
    c. Verify that Chan 1 LED on the receiver is now lit.
    d. Connect the timeline decoder to Chan 1 TTL DATA OUT on the receiver transition module.
    e. Set the DIP switch of one of the decoders channels to 0Ah. Note the top switch is the MSB.
    f. Set another channel on the decoder to 14h.
    g. Verify that the LED's for these decoder channels occasionally blink.
    h. Disconnect the decoder and connect the scope to the receiver output using the scope adapter.
    i. The signals amplitude and pulse width should be as shown if Fig. 1.
    j. Plug the timeline source into the TTL DATA IN 2 twinax located on the xmit transition module.
    k. Connect Chan 2 f/o xmit output with Chan 2 receiver f/o input using a f/o jumper.
    l. Verify that Chan 2 LED on the receiver is now lit.
    m. Connect the timeline decoder to Chan 2 TTL DATA OUT on the receiver transition module.
    n. Verify that the LED's for these decoder channels occasionally blink.
    o. Disconnect the decoder and connect the scope to the receiver output using the scope adapter.
    p. The signals amplitude and pulse width should be as shown if Fig. 1.

2.5 Indicator tests ECL input, Chan 1
    a. Turn off chassis power and remove xmit module.
    b. On the module install jumpers E1-E2, E3-E4, E9-E10, E11-E12.
    c. Plug transmitter under test back into the 3U chassis.
    d. Turn power on.
    e. Plug the timeline source into the TTL DATA IN 2 twinax located on the xmit transition module.
    f. Connect a f/o jumper between Chan 2 xmit out and Chan 2 receive in.
    g. Connect a twinax cable from receiver Chan 2 ECL output to xmit ECL DATA IN 1.
    h. Verify the xmit Chan 1 active LED is lit.

2.6 Optical output power with ECL circuitry, Chan 1
    a. Connect a fiber optic jumper between Chan 1 f/o output and the FOTEC power meter.
    b. Verify the output power reads so where in the range of -19 to -14 dbm.

2.7 Link operation test with ECL circuitry, Chan 1
    a. Connect Chan 1 f/o xmit output with Chan 1 receiver f/o input using a f/o jumper.
    b. Verify that Chan 1 LED on the receiver is now lit.
    c. Connect the timeline decoder to Chan 1 TTL DATA OUT on the receiver transition module.
    d. Verify that the LED's for these decoder channels occasionally blink.
    e. Disconnect the decoder and connect the scope to the receiver output using the scope adapter.
    f. The signals amplitude and pulse width should be as shown if Fig. 1.

2.8. Indicator tests ECL input, Chan 2
     a. Turn off chassis power and remove xmit module.
     b. On the module install jumpers E5-E6, E7-E8, E13-E14, E15-E16.
     c. Plug transmitter under test back into the 3U chassis.
     d. Turn power on.
     e. Plug the timeline source into the TTL DATA IN 1 twinax located on the xmit transition module.
     f. Connect a f/o jumper between Chan 1 xmit out and Chan 1 receive in.
     g. Connect a twinax cable from receiver Chan 1 ECL output to xmit ECL DATA IN 2.
     h. Verify the xmit Chan 2 active LED is lit.

2.9 Optical output power with ECL circuitry, Chan 2
     a. Connect a fiber optic jumper between Chan 2 f/o output and the FOTEC power meter.
     b. Verify the output power reads so where in the range of -19 to -14 dbm.

2.10 Link operation test with ECL circuitry, Chan 2
     a. Connect Chan 2 f/o xmit output with Chan 2 receiver f/o input using a f/o jumper.
     b. Verify that Chan 2 LED on the receiver is now lit.
     c. Connect the timeline decoder to Chan 2 TTL DATA OUT on the receiver transition module.
     d. Verify that the LED's for these decoder channels occasionally blink.
     e. Disconnect the decoder and connect the scope to the receiver output using the scope adapter.
     f. The signals amplitude and pulse width should be as shown if Fig. 1.